REMARKS

Claims 45-55, 57, 59, 66-73, 82-84, and 86 are pending in the present application, claims 56, 58, 60-65, 74-81, and 85 having been cancelled herein. The Office Action and cited references have been considered. Favorable reconsideration is respectfully requested.

The Examiner is thanked for the courtesies extended during the personal interview on December 10, 2007. The amendments made herein are presented in accordance with the discussions during that interview.

The remarks submitted in Applicant's prior responses are incorporated by reference herein. Applicant further submits that the claims are patentable for the reasons set forth below.

35 U.S.C. § 102

Claim 45 was rejected under 35 U.S.C. § 102(b) as being anticipated by Barnsley (U.S. Patent No. 5,488,501). This rejection is respectfully traversed.

Claim 45 recites in a telecommunication system, a method for routing optical data signals using a first communication path comprising at least one optical fiber extending between at least two network elements of the telecommunication system for carrying optical data signals separated from optical addressing signals, and a second communication path comprising one or more optical fibers extending between at least two network elements of the telecommunication system for carrying optical addressing signals separated from the optical data signals. The method comprises the steps of providing a combination of the optical addressing signals to provide addressing information required for establishing an address for routing the optical data signals, and providing at least one of the at least one optical fiber

comprised in the first communication path for carrying the optical data signals separated from the optical addressing signals is different from any of the one or more optical fibers comprised in the second communication path. The optical data signals conveyed separately from the optical addressing signals along the at least one optical fiber were generated at a plurality of different network elements. This is not taught, disclosed or made obvious by the prior art of record.

The Office action asserts that Barnsley discloses "a first communication path (citing the optical path between splitter 7 and switch 8) extending between at least two network elements (citing splitter 7 and switch 8) and comprising at least one optical link (e.g., the optical link between the output of splitter 7 and the input of optical switch 8) for carrying optical data signals. In Barnsley, the splitter 7 takes a small proportion of the control signal 5a of an incoming packet (coming in on path 2), and feeds it to the filter 14 through the amplifier 15. Col. 4, lines 18-21. However, the rest of the control signal travels **with** the data signal along the fiber 2 between the splitter 7 and the switch 8. Thus, Barnsley does not teach the claimed combination as recited in the claim, because the path between 7 and 8 in Barnsley does not carry optical data signals separated from the optical addressing signals as recited in claim 45.

Further, the points 6, 7 and 15 of Barnsley are not network elements as they would be understood by one of ordinary skill based on Applicant's disclosure. In particular, points 6, 7 and 15 do not having routing capability. Only the nodes described in Barnsley have such capabilities, and as described above, Barnsley does not disclose two different communication paths between those nodes.

During the interview, the Examiner explained his position that the claimed "first communication path" extends between optical data generator 4, coupler 6, splitter 7 and switch 8, and the "second communication path" extends between header generator 5, coupler 6, splitter 7 and switch 8. Then, according to the Examiner, the line between data generator 4 (a network element) and between coupler 6 carries only data signals, so that meets the claimed "a first communication path . . . comprising at least one optical link (line 4-6) for carrying optical data signals separated from optical addressing signals". Further, the Examiner explained that in his opinion, the line between header generator 5 (a network element) and coupler 6 carries only addressing signals, so that meets the claims "a second communication path . . . comprising one or more optical links for carrying optical addressing signals separated from said optical data signals." The Examiner explained his belief that Barnsley's data signals 5a are the "combination of said optical addressing signals to provide addressing information required for establishing an address for routing the optical data signals". Then, according to the Examiner, the optical link between 4 and 6 carries optical data signals separated from the optical addressing signals comprised in said first communication path" and is physically different from any of the optical links (link 5-6) for carrying the optical addressing signals separated from the optical data signals comprised in the second communication path.

Applicant has amended claim 45 to distinguish the claimed invention over this interpretation. In particular, claim 45 now makes clear that the first communication path comprises at least one optical fiber extending between at least two network elements of the telecommunication system for carrying optical data

signals separated from optical addressing signals, and a second communication path comprising one or more optical fibers extending between at least two network elements of the telecommunication system for carrying optical addressing signals separated from the optical data signals. Further, according to the claimed method, at least one of the at least one optical fiber comprised in the first communication path for carrying the optical data signals separated from the optical addressing signals is different from any of the one or more optical fibers comprised in the second communication path. Finally, the optical data signals conveyed separately from the optical addressing signals along the at least one optical fiber were generated at a plurality of different network elements.

There is no suggestion in Barnsley that the path between elements 4 and 8 is an optical fiber different from any of the optical fibers comprised in a second communication path (the path between elements 5 and 8 according to the Examiner's interpretation) extending between at least two network elements of the telecommunication system for carrying optical addressing signals separated from the optical data signals. In fact, the path from 4-8 and 5-8 overlap one another between coupler 6 and splitter 7. Thus, Barnsley does not teach Applicant's claimed invention arranged as recited in claim 45.

For at least these reasons, Applicant respectfully submits that claim 45 is patentable over Barnsley.

35 U.S.C. § 103

Claims 46-47, 53, 55-56, 61, 63-64, 66, 72, 76-79, 82-84, and 86 were rejected under 35 U.S.C. § 103 as being unpatentable over Fatehi (U.S. Patent Number 6,600,583) in view of Barnsley. Claims 48-52, 54, 57-0, 62, 67-71, and 73

were rejected under 35 U.S.C. § 103 as being unpatentable over Fatehi in view of Barnsley and Nir (U.S. Patent No. 6,160,653). Claims 56, 58, 60-64, and 76-79, have been cancelled as noted above, thus rendering the rejection of these claims moot. The rejections of the remaining claims are respectfully traversed for the following reasons.

Claim 46 recites in a telecommunication system, a method for routing optical data signals between at least two routers in the system. The method includes generating first optical addressing signals by converting signals identifying a destination address into corresponding optical addressing signals, transmitting the optical addressing signals over one or more optical addressing links from one of the at least two routers to another router of the at least two routers, and transmitting the optical addressing signals separated from the optical data signals over one or more optical fibers comprised in a first communication path, the first communication path extending from one of the at least two routers to another router, and concurrently or subsequently transmitting the optical data signals separated from the optical addressing signals to the another router via a second communication path comprising at least one optical fiber. The second communication path extends from said one router of the at least two routers to the another router, and comprises at least one optical fiber which is different from any of the at least one optical fibers comprised in the first communication path. The optical data signals being conveyed separately from the optical addressing signals were generated at a plurality of different network elements.

Claim 46 is used as an example. The other independent claims also recite, in different ways, that there are different optical fibers for carrying optical

data signals separate from the optical addressing signals and optical fibers for carrying the optical addressing signals separate from the optical data signals.

For example, claim 66 recites " means for transmitting said optical addressing signals from said routing apparatus to a second router over a first communication path comprising at least one optical fiber for carrying said optical addressing signals separated from said optical data signals and means for transmitting said optical data signals from said routing apparatus to said second router along a second communication path comprising at least one optical fiber, said at least one optical fiber for carrying said optical data signals separated from said optical addressing signals and wherein said at least one optical fiber for carrying said optical data signals separated from said optical addressing signals is different from any of the at least one optical fibers comprised in said first communication path, and wherein said optical data signals being conveyed separately from said optical addressing signals, were generated at a plurality of different network elements." Claim 82 recites " transmission means for transmitting said optical addressing signals separated from said optical data signals over a first communication path comprising one or more optical fibers and extending between the at least two network elements towards said destination address," and "transmission means for transmitting said optical data signals towards said destination address a second communication path comprising at least one optical fiber extending between the at least two network elements for conveying said optical data signals separated from said optical addressing signals, wherein at least one of said at least one optical fiber in said second communication path is different than any of the at least one optical fibers comprised in the second communication path, and wherein said optical data

signals being conveyed separately from said optical addressing signals, were generated at a plurality of different network elements." Finally, claim 86 recites "transmission means for transmitting the second optical addressing signals separated from optical data signals over one or more optical fibers extending from said telecommunication routing apparatus towards the destination address representing a second network element," "receiving means for receiving optical data signals generated at a plurality of different network elements," and " transmission means for transmitting the optical data signals received towards the destination address along an optical path extending from the telecommunication routing apparatus toward the second network element which comprises at least one optical fiber that is different from any one of said one or more optical fibers over which the second optical addressing signals separated from the optical data signals are transmitted."

These features, in combination as recited in the claims, are not taught, disclosed or made obvious by the prior art of record.

According to the teachings of Fatehi, the addressing and data signals are always conveyed along the same physical path, though they may be conveyed at different times. For example, column 4, lines 1-15, states that

> we utilize an "optical message tag" on the carrier wavelength which includes packet destination information associated with a group of packets which are carried on a wavelength. Optical tagging is described in U.S. Pat. No. 5,745,274,..., which describes the use of a frequency tone as a sub-carrier for carrying message tags, [and] under certain conditions, one could modulate the message tags directly on the envelopes of the data carrying wavelengths without using sub-carrier tone frequencies.

The Office Action acknowledges that Fatehi does not teach or suggest that the addressing links are at least partially different from the optical data links. The Office Action cites Barnsley as allegedly teaching this concept, and alleges that it would have been obvious to one of ordinary skill in the art to "allow the optical data link and the optical addressing link to be on at least partially physically different paths," and that one of ordinary skill would have been motivated to do so "to allow the addressing data to be used to route the optical data signals through a switch (abstract of Barnsley)." Applicant respectfully disagrees.

First, Fatehi describes that "optical tags are formed by modulating individual optical carriers (e.g. lasers) with a unique identifier signal (i.e. frequency tone) that can be readily read, modified or written. While this patent describes the use of a frequency tone as a subcarrier for carrying message tags, under certain conditions, one could modulate the message tags directly on the envelopes of the data carrying wavelengths without using subcarrier tone frequencies." (Col. 4 lines 7-15). Since Fatehi states very clearly that optical tags are formed by modulating optical carriers with a unique identifier signal, there is no reason for a person ordinarily skilled in the art to envision the opposite, *i.e.*, that the data signals and addressing signals, the tags, should not be modulated in order to allow conveying them along different routes. Thus, if at all, a combination of Fatehi with a reference that teaches the use of a subcarrier for carrying the control data such as Barnsley, can only be construed as teaching away from the present invention.

Moreover, Fatehi states the following:

> In accordance with the present invention, optical tagging is associated with a group of packets and used for signaling between routers for controlling the routing of that group of packets over an optical network of Fig. 1. The superimposed

> "tag" can be removed in the optical domain. . . . More importantly, a new tag can be generated in the optical domain and applied in the intermediate router/cross-connects." (Col. 4, lines 18-27.)

Thus, the person ordinarily skilled in the art would have undoubtedly realized that the optical tags (the addressing signals) must be conveyed along the very same physical path as the data signals. As there is no a priori knowledge at which intermediate routers/cross connects along the path for conveying the addressing signals will the newly generated tag be applied, there is no way to determine a priori the two paths (each comprising a plurality of links) that could be used for conveying the data signals and the addressing signals, while complying with the two constraints: a) that at least one or more of the links in the two paths are different, and b) that both the old tag and the data reach the same intermediate router/cross-connect in a synchronized way to allow applying the newly generated tags.

The Office Action asserts that Fig. 4 of Fatehi teaches separation of address tags within a router (page 5, line 1). Applicant respectfully disagrees. Fig. 4 is discussed on col. 7, lines 8-54. In that section, Fatehi states:

> [w]hen a router, e.g., R1 of FIG. 4 is used as a source router, an Add unit 404 is used, in a well known manner, to add a source signal (after conversion to optics) to an existing or new wavelength via the cross-connect 401, under control of controller 403. Each source router multiplexes traffic to the various destination routers. The multiplexed traffic is then converted to optics and transported using one or more wavelengths. The source router also generates message tags on the wavelength(s) using tag read/write apparatus 402. The tag is read at the intermediate routers and depending on the destination address embedded in the tag the router controller establishes the path to the next router en-route to the destination. When the source router has traffic to another destination and the "tagged" wavelength becomes available, the source router "untags" the fields and "tags" the wavelength with the new destination address (and other relevant information) on the wavelength.

Since the message tag has a destination address embedded in it, Fatehi Fig. 4 does not suggest a separation of address tags within the router.

Furthermore, Applicant respectfully submits that the combination which the Examiner proposed of Fatehi and Barnsley cannot be considered as one that teaches the claimed features that is missing from Fatehi alone, *i.e.*, that there are different optical fibers for carrying optical data signals separate from the optical addressing signals and optical fibers for carrying the optical addressing signals separate from the optical data signals. Barnsley teaches conveying of optical data signals at a first wavelength and control signals at a second wavelength, while multiplexing the data and control signals onto the transmission line through which the signals then pass between the two nodes. Only once the signals reach the destination node 1 is a small portion of the control signals diverted to a band pass filter 14 via a splitter 7. (Col. 4, lines 18-21; Fig. 1). As discussed above, in Barnsley, the splitter 7 takes a small proportion of the control signal 5a of an incoming packet (coming in on path 2), and feeds it to the filter 14 through the amplifier 15. Col. 4, lines 18-21. However, the rest of the control signal travels **with** the data signal along the fiber 2 between the splitter 7 and the switch 8. Thus, Barnsley does not teach the claimed combination as recited in the claim, because the path between 7 and 8 in Barnsley does not carry optical data signals separated from optical addressing signals as recited in claim 46.

Further, as discussed above with respect to claim 45, there is no suggestion in Barnsley that the path between elements 4 and 8 is an optical fiber different from any of the optical fibers comprised in a second communication path (the path between elements 5 and 8 according to the Examiner's interpretation)

extending between at least two network elements of the telecommunication system for carrying optical addressing signals separated from the optical data signals. In fact, the path from 4-8 and from 5-8 overlap one another between coupler 6 and splitter 7. Thus, Barnsley does not teach Applicant's claimed invention arranged as recited in claim 45, 46, 66, 82, and 86.

Furthermore, according to Barnsley, the system disclosed includes "means for multiplexing the data and control signals onto the transmission line in such a manner that the duration of the control signal is at least equal to the duration of the data signal ... to ensure that the control signal completely overlaps the data signal on arrival at the second node " (col. 1, lines 59-66) and also "As the control signal overlaps the data signal, the two signals occupy the same time slot" (col. 2, lines 3-4).

Thus, it is clear from the disclosure of Barnsley that the both data and control signals must arrive together to the next node. Moreover, the operation of the whole Barnsley system relies and is based upon the fact that both data and control signals arrive together. "The header generator 5 produces header (control) signals... by modulating a second laser ... so that the laser of the header generator 5 is turned on at, or just before, the start of the data packet... the header generator 5 is tunable so as to provide control signals at different wavelengths, each of which matches the receive wavelength of another network node" (col. 3, line 60 - col. 4, line 5). In other words, for the Barnsley system to route a packet, the packet must contain the addressing signal. Therefore, if at all, Barnsley must be considered as teaching away from the present invention.

Thus, there is no indication, nor any implicit motivation provided by Barnsley, to transmit the data and control signals along different paths between two nodes or routers in the system, because Barnsley does not do so, and in fact, teaches away from doing so. As discussed above, claims 45, 46, 66, 82 and 86 have been amended to further distinguish the claimed subject matter from the teachings of Fatehi and Barnsley, whether taken alone, or in combination as asserted in the Office Action. Neither Barnsley nor Fatehi teach or suggest there are different optical fibers for carrying optical data signals separate from the optical addressing signals and optical fibers for carrying the optical addressing signals separate from the optical data signals.

For at least these reasons, Applicant respectfully submits that the independent claims 45, 46, 66, 82, and 86 are patentable over the prior art of record

Further, Applicant respectfully submits that the dependent claims, depending from each of the independent claims respectfully, are patentable in and of themselves and as they depend from and include the recitations of the independent claims from which they depend for the reasons discussed above.

In view of the above amendments and remarks, Applicant respectfully requests reconsideration and withdrawal of the outstanding rejections of record. Applicant submits that the application is in condition for allowance. Early notice to this effect is most earnestly solicited.

If the Examiner has any questions, or is inclined not to withdraw the outstanding rejections, he is invited to contact the undersigned at 202-628-5197, to advance prosecution.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant

By /Ronni S. Jillions/
Ronni S. Jillions
Registration No. 31,979

RSJ:me
Telephone No.: (202) 628-5197
Facsimile No.: (202) 737-3528
G:\BN\E\eci\Mahlab2\PTO\2007-12-11AmendmentMAHLAB2.doc